

- Fig. 13. The same from below (also slightly modified from a figure given by Thorell).
- Fig. 14. *Gonyleptes* (an Opilio) to show the fusion of the anterior 4 (? 5) abdominal tergites with the carapace and the 4 (1-4) free tergites and 5 (1'-5') free sternites.
- Fig. 15. The same from below, for comparison with fig. 14.
- Fig. 16. *Holothyrsus* (one of the Acari), for comparison with fig. 13, to show the jointed, chelate mandible, and pediform palpi I, II. (after Thorell). *a*, anus; *g*, position of genital orifice.
- Fig. 17. Diagram of one of the Solifugæ, to show the segmentation of the carapace, the basal segment of the mandible (*b*) fused to the cephalic shield, the position of the stigmata on the 2nd and 3rd (morphologically, I think, the 3rd and 4th) segments of the abdomen, and (*s*) the position of the cephalothoracic stigmata.

N.B.—Where I have taken the liberty of utilizing figures published by Dr. Thorell, I wish it to be understood that I have tested their accuracy by an examination of actual specimens.

II.—*Descriptions of Thirteen new Species of Terrestrial Mollusca from South Africa.* By JAMES COSMO MELVILL, M.A., F.L.S., and JOHN HENRY PONSONBY, F.Z.S.

[Plate III.]

THIS, our sixth contribution on the subject, we present in fulfilment of our promise (Ann. & Mag. Nat. Hist. 1892, vol. x. p. 237) to deal with new forms of *Ennea* and *Pupa*. We now describe four of the former genus and seven of the latter.

1. *Helix (Pella) strobilodes*, sp. n. (Pl. III. fig. 1.)

H. testa obtecte umbilicata, conica, tenui, sordide alba, epidermide sericco-cornea contacta; anfractibus sex, supra angustatis, infra ad basin rapide accrescentibus, paullum ventricosis; apertura lunari; peristomate tenui, simplici, apud umbilicum triangulatim reflexo.

Long. 7·75, lat. 5·50 mill.

Hab. Tharfield.

A somewhat conical, close-whorled shell, with simple mouth and narrow umbilicus, allied to *H. Loveni*, Krauss.

Two specimens.

2. *Helix (Patula) somersetensis*, sp. n. (Pl. III. fig. 2.)

H. testa aperte umbilicata, subconico-depressa, lævi, albo-cinerea;

anfractibus quatuor (ultimo rapide accrescente), ad suturas impressis, gradatulis; apertura ovali; peristomate tenui, simplici. Long. 2, lat. 1.50 mill.

Hab. Somerset East (*Miss M. L. Bowker*).

A shell of simple character, with a superficial resemblance to *H. (Vallonia) pulchella*, Müll. In the collection of E. L. Layard, Esq.

Two specimens.

3. *Pupa tabularis*, sp. n. (Pl. III. fig. 3.)

P. testa minuta, subdiaphana, cylindrica, brunneo-succinea, lævi; anfractibus 5-6, ventrosulis, ad suturas compressis; apertura rotunda; peristomate planato, minime reflexo, albescente, dente parietali conspicuo, intrante. Long. 3, lat. 1.50 mill.

Hab. Cape Town (*R. M. Lightfoot, Esq.*).

Recalls to some extent the British and European species *P. muscorum*, Linn. The whorls are somewhat ventricose, shining brown, and smooth; the peristome flattened, parietal tooth large and conspicuous.

Several specimens.

4. *Pupa dysorata*, sp. n. (Pl. III. fig. 4.)

P. testa minutissima, oblonga, lævi, apice obtuso; anfractibus 7-8, ventricosis, ad suturas compressis; apertura ovali; peristomate albido, paullum reflexo, ad marginem columellarem incrassatum unidentato. Long. 2, lat. .55 mill.

Hab. Griqualand East (*E. R. Sykes, Esq.*).

A microscopic, oblong, narrowed species of dull plain substance; whorls ventricose; peristome ovate, with one tooth on the somewhat broadened columellar margin.

5. *Pupa quantula*, sp. n. (Pl. III. fig. 5.)

P. testa minutissima, rimata, diaphana, brunnea, cylindriformi, apice obtuso; anfractibus sex, microscopice tenuiliratis, valde ventricosis, præsertim tribus mediis; apertura ovato-rotunda; peristomate simplici, reflexo. Long. 2, lat. .85 mill.

Hab. Port Elizabeth (*J. Crawford*).

Exceedingly minute, with simple mouth and remarkably swollen ventricose whorls, especially the third, fourth, and

fifth, and cylindrical in shape; it is longitudinally striated, but so minutely as to be almost invisible even with a fairly strong lens.

Three specimens.

6. *Pupa Sykesii*, sp. n. (Pl. III. fig. 6.)

P. testa minuta, rimata, cylindrica, diaphana, apice obtuso; anfractibus quinque, tumescentibus, ventricosis, undique confertim exquisitè longitudinaliter tenuicostatis; apertura ovata; peristomate paullum reflexo, colorato, duobus dentibus munito, hoc parietali, illo basali, oppositis, inconspicuis.

Long. .90, lat. .75 mill.

Hab. Griqualand East (*E. R. Sykes, Esq.*).

Another very small but exquisite little species. It is obtuse, cylindrical, with tumid whorls; the teeth of the peristome are with difficulty distinguished with a lens; they are opposite to one another, one parietal, the other basal. The shell is umbilicated, with the outer columellar margin of the lip reflected to some extent over the umbilicus, and the tumid whorls are everywhere ornamented with fine oblique longitudinal striæ.

7. *Pupa haploa*, sp. n. (Pl. III. fig. 7.)

P. testa oblongo-pyramidata, tenuissima, apice obtusato; anfractibus septem, ventricosis, undique longitudinaliter tenuistriatis, apud suturas impressis; apertura ovali; peristomate incrassatulo, simplici.

Long. 1.70, lat. .75 mill.

Hab. Pretoria.

A very small oblong species, with simple and very slightly thickened peristome.

8. *Pupa pretoriensis*, sp. n. (Pl. III. fig. 8.)

P. testa minutissima, tenui, cinereo-brunnea, apice appanato, contabulato; anfractibus quinque, valde ventricosis, undique longitudinaliter tenuistriatis, tribus ultimis latitudine æqualibus; apertura rotunda; peristomate incrassatulo, simplici, apud marginem columellarem reflexo.

Long. 1, lat. .55 mill.

Hab. Pretoria.

Exceedingly small, with simple mouth, and peristome slightly incrassate. The whorls are five in number, very ventricose, all longitudinally finely striate; apex extremely flattened and broad.

9. *Pupa griqualandica*, sp. n. (Pl. III. fig. 9.)

P. testa minutissima, rimata, tenui, rotundo-cylindrica, brunnea; anfractibus quinque, ventrosulis, apud suturas compressis, undique confertim longitudinaliter tenuistriatis, ultimo anfractu in medio dorsualiter juxta labium exterius depresso-sulcato; apertura ovato-rotunda; peristomate incrassato, ad marginem labialem unisinuato, plicato, plicis parietalibus duabus, valde prominentibus, recurvis, tertia, marginem apud columellarem, dentiformi.

Long. 1, lat. .75 mill.

Hab. Griqualand East (*E. R. Sykes, Esq.*).

Extremely small, but with a wonderfully complicate mouth, being furnished with three plaits, one of them being prominent, straight, and parietal, the second also parietal, central, somewhat recurved and very pronounced and distinct, extending nearly two thirds of the diameter of the orifice, in a slightly oblique direction; the third plait is tooth-shaped and towards the columellar margin. The shell is thin, finely longitudinally striate, with five whorls, which are tumid, and compressed at the sutures.

Three or four specimens.

10. *Ennea distincta*, sp. n. (Pl. III. fig. 10.)

E. testa subrimata, cylindriformi, obtusa, pallide cornea; anfractibus octo, quorum tribus ad apicem brevibus, quatuor latitudine fere uniformibus, ultimo ad basin paullum producto, undique oblique regulariter densistriatis; apertura ovato-rotunda; peristomate nitente albido, reflexo, dentibus quatuor instructo, tribus parvis labialibus, uno parvulo ad basin, plica columellari interna, planata, subtus marginem intrante.

Long. 12, lat. 4.50 mill.

Hab. Middleburg, Transvaal (*J. Crawford, Esq.*).

A conspicuous and proportionately large species of *Ennea*, of a delicate straw-brown colour, shiny white peristome, with prominent parietal plait, and furnished with four small teeth—one being close to the aforesaid plait, two at the labial inner margin, one at the basal,—the columellar plait being deep-seated and below the outer peristome; the shell is barrel-shaped, very obtuse at the apex, and cylindrical, eight-whorled, and beautifully obliquely finely striated.

Five specimens. Allied to *E. Albersi*.

11. *Ennea regularis*, sp. n. (Pl. III. fig. 11.)

E. testa rimata, tenera, obtusa, subhyalina, ochreo-nivea, cylin-

drica; anfractibus sex, undique longitudinaliter oblique tenuistriatis, ad suturas compressis; apertura ovata; peristomate reflexo, plicis duabus dentibusque quatuor instructo, plica parietali magna, valide intrante, columellari interna, mammæ-formi, dentibus duobus ad marginem labialem, tertio ad basin, quarto parvulo columellari.

Long. 7, lat. 3.50 mill.

Hab. Cope's Folly, Maritzburg (*H. Burnup, Esq.*).

A neat, delicate, and chaste species, albeit of moderate dimensions. It is white, with an ochraceous tinge, cylindrical, obtuse at the apex, six-whorled, the whorls being very compressed at the sutures, so much so as almost to appear channelled; the aperture is ovate; peristome shining white and reflexed, furnished with a parietal plait of conspicuous size and projection, also a columellar plait, internal and nipple-shaped. Besides this there are four teeth, two labial, the lower being the larger, one at the base, and one columellar.

One specimen.

12. *Ennea perspicua*, sp. n. (Pl. III. fig. 12.)

E. testa subrimata, pellucida, vitrea, tenui, cylindrica, apice obtuso; anfractibus septem, levibus, compressulis; apertura ovata; peristomate reflexo, biplicato et bidentato, plica parietali magna prominente, columellari interna valde intrante, dente labiali conspicuo, basali parvo.

Long. 4, lat. 2.25 mill.

Hab. Transvaal.

Very small for the genus, but of beautifully shining and transparent texture, with the whorls quite smooth and the mouth with a complicated arrangement of teeth and plaits, two of each—the parietal or sutural plait being thin, sharp, and prominent, the labial tooth conspicuous and large, the basal smaller; the columellar plait very distinct and wholly internal.

Two specimens.

13. *Ennea Collieri*, sp. n. (Pl. III. fig. 13.)

E. testa cylindriformi, pellucida, tenui; anfractibus septem, ventricosis, ad suturas compressis, undique longitudinaliter suboblique costulatis; apertura rotundo-ovata; peristomate albo, nitido, duabus plicis et dente uno instructo, plica parietali multum prominente, acuta, plica interna subtus marginem columellarem lata, dente uno labiali.

Long. 7, lat. 4 mill.

Hab. Pretoria. In coll. Edward Collier, Esq.

A transparent shining little species, with regularly costulate whorls, ventricose, seven in number; the shell is cylindrical in shape; peristome shining white, somewhat translucent, as is the rest of the shell, furnished with a prominent acute parietal fold and an internal broad plica behind the columellar margin of the peristome. There is also one simple labial tooth.

Two specimens, one of which is slightly more elongate than the other.

EXPLANATION OF PLATE III.

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| <i>Fig. 1. Helix strobilodes.</i> | <i>Fig. 8. Pupa pretoriensis.</i> |
| <i>Fig. 2. — somersetensis.</i> | <i>Fig. 9. — griqualandica.</i> |
| <i>Fig. 3. Pupa tabularis.</i> | <i>Fig. 10. Ennea distincta.</i> |
| <i>Fig. 4. — dysorata.</i> | <i>Fig. 11. — regularis.</i> |
| <i>Fig. 5. — quantula.</i> | <i>Fig. 12. — perspicua.</i> |
| <i>Fig. 6. — Sykesii.</i> | <i>Fig. 13. — Collieri.</i> |
| <i>Fig. 7. — haploa.</i> | |

III.—Additional Notes on the Origin of the Tracheæ from Setiparous Glands. By HENRY M. BERNARD, M.A. Cantab. (from the Huxley Research Laboratory).

IN the last issue of the 'Zoologische Jahrbücher' (Bd. v.) I brought forward some evidence in favour of the derivation of the Arthropodan tracheæ from setiparous glands, and pointed out how this derivation might be made to explain many of the difficulties which at present beset this subject. I propose here to bring forward a few more arguments tending in the same direction.

(1) I endeavoured to show that in the Myriapoda, while we could deduce the tracheæ from the notopodial acicular glands, the stink-glands which occur dorsally to the stigmata might be the glands of the original parapodial setæ. Mr. Pocock, of the British Museum, kindly informs me that in the Chordeumidæ, which appear in many respects to be intermediate forms between the Iulidæ and the Polydesmidæ, the foramina repugnatoria of these latter are not to be found, but setæ develop apparently exactly on the spot where these glands ought to occur, and, further, that in the Polyxenidæ a great tuft of setæ grows in the same spot, apparently in place of the stink-glands which are wanting, and, again, a still more important fact, that in *Scolopendrella*, in which animal the